

Simple Machines

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A simple machine is a device that is made of one or no moveable parts. It is used to make work simpler by changing the direction that a force is applied or multiplies the force added to the system. Compound machines are made up of more than one simple machine.

Name: _____ Date: _____

Most devices that simplify our work are made of one or more simple machines. Can you remember all of the simple machine names?

Try naming them below:

- | | |
|---------|---------|
| 1 _____ | 2 _____ |
| 3 _____ | 4 _____ |
| 5 _____ | 6 _____ |

The six simple machines can be broken into two classes: I) the inclined plane, wedge, and screw characterized by movement in a line and II) the lever, pulley, wheel and axle characterized by movement around a pivot point.

The idea that a machine can be broken down into simple machines came about from the famous Greek philosopher Archimedes. Archimedes was a mathematician, physicist, engineer, inventor and astronomer who lived from 287 BC – 212 BC. Some of the items he is famous for include his work with classifying simple machines, discovery of principles for simple machines as well as inventions using simple machines.

Let's use some machines we see in our kitchen, determine what types of simple machines are combined to make them work, and try to determine how they operate.

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Students will be able to:

Complete the lab activity

Record their data and construct their graph

Interpret and extrapolate from their data

Share their results with others

Activity: Simple Machines

MATERIALS NEEDED:

Station 1: Apple and Cheese

Apple peeler and corer
in one machine -
(An apple per student)

Cheese slicer and a cheese
grinder with a hand crank

Sharp cheddar cheese
(½ block cheese per group)

Station 2: Eggs/ Beans

A Bean slicer

Beans
(3 to 4 per student)

Egg dicer

Hard boiled eggs
(one per student)

Carrot peeler
(one carrot per student)

Teacher notes:

Set up four stations with
simple cooking machines
and food.

The following are ideas
to help you get started.

Name: _____ Date: _____

The kitchen is a place where we find many tools that help us complete our cooking tasks. Let's take a look at some of these tools, use them, and enjoy the product of our time.

Station 1:

You will find two tools at this station. An apple peeler/corer and a cheese grater.



Take a close look at the apple peeler/corer. Try using the apple peeler to peel and core an apple.

- 1 Explain below how it works:

- 2 What simple machines are found in the apple core/peeler?

- 3 What simple machines are found in the cheese grater?

Station 2:

You will find three tools at this station. A bean slicer, egg dicer and carrot peeler.



Take a close look at the bean slicer. Try using the bean slicer to slice beans.

- 1 Explain below how it works:

- 2 What simple tools are found in the bean slicer?

- 3 What simple tools are found in the egg dicer?

- 4 What simple tools are found in the carrot peeler?

Activity: Simple Machines

MATERIALS NEEDED:

Station 3:

Whipped cream and fruit

Grapefruit sectioner

Grapefruit
(one per four to six students)

Melon ball maker

One large melon for class
or two small melons

Strawberry huller

Strawberry per student

Egg beater

Heavy cream and sugar

One pint heavy cream
per two groups

Station 4:

Bread/ Spinach/butter

Knife

(for cutting fresh bread
by the teacher)

Large Italian baguette per class

Butter knife
(spread butter on bread)

One butter pad per student
or several sticks of butter to
slice up

Lettuce spinner
(spins water off of greens)

Baby spinach
(one bag per class)

Teacher notes:

Have the students think about other simple tools they use in their daily lives and talk about the types of machines that are incorporated in them.

Name: _____ Date: _____

Station 3:

You will find four tools at this station. An egg beater, a strawberry huller, a grapefruit sectioner and a melon ball maker.



Take a close look at the egg beater. Try using the egg beater to whip cream.

- 1 Explain below how it works.

- 2 What simple tools are found in the grapefruit sectioner?

- 3 What simple tools are found in the melon ball maker?

- 4 What simple tools are found in the strawberry huller?

Station 4:

You will find three tools at this station. A lettuce spinner, a bread knife, and chop sticks.



Take a close look at the lettuce spinner. Try using the lettuce spinner to dry off baby spinach leaves.

- 1 Explain below how it works.

- 2 What tools are found in the bread knife?

- 3 What tools are found in the chop sticks?

Notes:

New York State Elementary Level Science Standards

Classifying, comparing and contrasting, generalizing, making decisions, manipulating materials, observing

Standard 1: Scientific Inquiry:

Key idea 1; s1.1, s1.3a

Key idea 2; s2.2a, s2.3

Key Idea 3; s3.3, s3.4

Skills and Strategies for interdisciplinary problem solving:

Working effectively, generalizing and analyzing ideas,

General Skills:

Safely use simple machines

lii, iv, ix, xii, xvi, xix

Standard 4:

Key idea 5: 5.1f